

A Review of Caspian Tern Nesting Habitat: Appendix A

*A Feasibility Assessment of Management Opportunities
in the U.S. Fish and Wildlife Service Pacific Region*



A Review of Caspian Tern (*Sterna caspia*) Nesting Habitat:
*A Feasibility Assessment of Management Opportunities
in the U.S. Fish and Wildlife Service Pacific Region*

Appendix A: Site Field Forms

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National Audubon Society et al. v. Colonel Randall J. Butler et al.

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**CASPIAN TERN SITE FEASIBILITY ASSESSMENT
FIELD FORM**

Date: July 24, 2002 Observer(s): N. Seto, Jack Smith, Max Zahn

Site Name: Sand Island, Grays Harbor, Grays Harbor County, Washington
Ownership: Washington State (Department of Natural Resources)

● Location:

- Nearest City/Town: Hoquiam, Washington
- Bay/Estuary/Waterbody: Grays Harbor
- Coordinates: Latitude N 46° 57' 31.7" Longitude W 124° 03' 27.9"
- Township, Range, Section: _____
- UTM Coordinates: Northing: 5201107.5 Easting: 419541 Zone: 10

● Size:

Total area of island or site: 60 - 80 ha (150- 200 a)
Area of current historical suitable habitat: 4 - 8 ha (10 - 20 a)
Area of potential habitat: 4 - 8 ha (10 - 20 a)

- Distance from East Sand Island: ~84 km (~52mi)
- Aerial photo obtained? (Y) or N Date/Source of Aerial Photo: _____

Site Description

- Type of site: Island Peninsula Lakeshore Rooftop Other

- Natural or Manmade? ★ Site Photographs? (Y) or N Number Taken: 10

- Structures present (i.e. roads, buildings, power lines, piers, etc.)? None

- Vegetative Communities (i.e. forb, grass, shrub, tree): European beach grass and dune grass, some large willow shrubs in high spots (eastern side of island).

- Soil Substrate (i.e. sand, gravel, silt, cobble, etc.): Sand

- Site Stability: Semi-stable, interior vegetated part of island is stable but sandy shoreline changes shape.

- Topography and Site profile: Flat with a rise of < 5 feet, interior part of island is heavily vegetated, shoreline and sandy spit on northwest portion of island is more appropriate for terns.

Comments: No double-crested cormorant observed on Sand Island when Goose Island was present. Historic nesting area of Caspian tern is located on the NW spit of Sand Island.

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): No nesting; several adults observed flying over island.

- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
Glaucous-winged/western gull hybrid	since 70's	500-700 (based on adult estimate)	
Double-crested cormorant		<25	
Brown Pelican		Large roost site	

- Prey Base (describe general type and distance from colony): Shiner perch, Pacific staghorn sculpin, white seaperch, chum salmon, whitebait smelt, snake prickleback, cutthroat trout, longnose dace, and northern anchovy

State or Federal listed fish species potential prey? Yes or **(No)**

Species: _____

- State or Federal listed wildlife/plants species associated with site: Bald Eagle, Snowy Plover, Brown Pelicans

Management issues: None

- Predators:

Avian (species; known occupancy/use of site): Bald Eagle, Gulls, Peregrine Falcon

Mammalian (species; known occupancy/access to site): None

- Disturbance (i.e. livestock, human, etc.): None, waters around the island are very shallow and thus make it difficult for boaters to approach island safely.

Site Management

- Management History (describe): No management.

- Current Management (describe): No management.

- Management Potential: This island is heavily vegetated and used by high numbers of nesting gulls and low numbers of double-crested cormorants. The spit located on the northwestern end of the island is where Caspian terns historically nested. This area is still good nesting habitat for Caspian terns because it is relatively unvegetated and is located ~150 meters from the large gull colony. No habitat enhancement would be necessary, but decoys and recordings would help attract Caspian terns to the island. Vegetation removal may need to occur repeatedly in the future as dune grass will most likely spread into this area. The potential for re-establishing a Caspian terns colony is good. There are no mammalian predator and human disturbance issues. The main concern would be gull predation.



Island profile above and potential Caspian tern nesting area (northwestern spit) below.



**CASPIAN TERN SITE FEASIBILITY ASSESSMENT
FIELD FORM**

Date: July 24, 2002 Observer(s): N. Seto, Jack Smith, Max Zahn

Site Name: No Name Island, Grays Harbor, Grays Harbor County, Washington

Ownership: WA State Department of Natural Resources

● Location:

- Nearest City/Town: Hoquiam, Washington
- Bay/Estuary/Waterbody: Grays Harbor
- Coordinates: Latitude N 46° 57' 01" Longitude W 124° 02' 26"
- Township, Range, Section: _____
- UTM Coordinates: Northing: 5200164.5 Easting: 420817.9 Zone: 10

● Size:

Total area of island or site: 32 - 40 ha (80-100 a)

Area of current/historical suitable habitat: None

Area of potential habitat: 8 - 12 ha (20 - 30 a)

● Distance from East Sand Island: ~ 84 km (52 mi)

● Aerial photo obtained? (Y) or N Date/Source of Aerial Photo: _____

Site Description

● Type of site: Island Peninsula Lakeshore Rooftop Other

● Natural or Manmade? ★ Site Photographs? (Y) or N Number Taken: 8

● Structures present (i.e. roads, buildings, power lines, piers, etc.)? None

● Vegetative communities (i.e. forb, grass, shrub, tree): European beach grass and some dune grass.
Much of this vegetation is recent, very little vegetation observed in 2000

● Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Sand

● Site stability: Semi-stable, island has been getting larger and covered with more vegetation

● Topography and Site profile: Flat with a rise of < 5 feet.

Comments: _____

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): No nesting; a couple of adults observed flying by island during site visit.
- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
Glaucous-winged x western gull		~500 (gross estimate based on number of adults observed)	
- Prey Base (describe general type and distance from colony): Shiner perch, Pacific staghorn sculpin, white seaperch, chum salmon, whitebait smelt, snake prickleback, cutthroat trout, longnose dace, and northern anchovy
 State or Federal listed fish species potential prey? Yes or No
 Species: _____
- State or Federal listed wildlife/plants species associated with site: Bald Eagle, Snowy Plover, Brown Pelicans
 Management issues: None
- Predators:

Avian (species; known occupancy/use of site): Bald Eagle, Gulls, Peregrine Falcon

Mammalian (species; known occupancy/access to site): None
- Disturbance (i.e. livestock, human, etc.): None, waters around the island are very shallow and thus make it difficult for boaters to approach island safely

Comments: _____

Site Management

- Management History (describe): No management.
- Current Management (describe): No management.
- Management Potential: This island is heavily vegetated and used by nesting gulls. The northwest portion of this island (~8-20 ha) contains some unvegetated areas that appear to remain above the high water line throughout the Caspian tern breeding season. No habitat enhancement would be necessary, but decoys and recordings would help attract Caspian terns to the island. Vegetation removal may need to occur repeatedly in the future as dune grass will most likely spread into this area. Since this island is located near a historic nesting island (that is no longer available), the potential for establishing a Caspian tern colony is high. There are no mammalian predator and human disturbance issues. The main concern would be gull predation.



Potential Caspian tern nesting area (unvegetated portions) above, and heavily vegetated areas found on the remainder of the island below.



**CASPIAN TERN SITE FEASIBILITY ASSESSMENT
FIELD FORM**

Date: July 24, 2002 Observer(s): N. Seto, Jack Smith, Max Zahn

Site Name: Unnamed Island, Grays Harbor, Grays Harbor County, Washington (Just east of No Name Is)

Ownership: Washington State (Department of Natural Resources)

● Location:

- Nearest City/Town: Hoquiam, Washington
- Bay/Estuary/Waterbody: Grays Harbor
- Coordinates: Latitude N 46° 57' 58" Longitude W 124° 00' 20"
- Township, Range, Section: _____
- UTM Coordinates: Northing: 5201889 Easting: 423504.1 Zone: 10

● Size:

Total area of island or site: 12 - 16 ha (30- 40 a)
Area of current/historical suitable habitat: None
Area of potential habitat: 4 - 8 ha (10 - 20 a)

● Distance from East Sand Island: ~84 km (52 mi)

● Aerial photo obtained? (Y) or N Date/Source of Aerial Photo: _____

Site Description

● Type of site: Island Peninsula Lakeshore Rooftop Other

● Natural or Manmade? ★ Site Photographs? (Y) or N Number Taken: 4

● Structures present (i.e. roads, buildings, power lines, piers, etc.)? None

● Vegetative communities (i.e. forb, grass, shrub, tree): Mostly unvegetated, some European beach grass and dune grass in higher spots.

● Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Sand

● Site stability: Semi-stable, island developed in recent years and has been getting larger.

● Topography and Site profile: flat with a rise of < 5 feet, interior part of island is soft, sandy and dune-like (most likely changing shape with the wind), shoreline is firmer and more appropriate for terns.

Comments: _____

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): No nesting; several adults observed flying and roosting on northern end of island during site visit.
- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
None			
- Prey Base (describe general type and distance from colony): Shiner perch, Pacific staghorn sculpin, white seaperch, chum salmon, whitebait smelt, snake prickleback, cutthroat trout, longnose dace, and northern anchovy
 State or Federal listed fish species potential prey? Yes or ☒ No
 Species: _____
- State or Federal listed wildlife/plants species associated with site: Bald Eagle, Snowy Plover, Brown Pelicans
- Management issues: None
- Predators:
 Avian (species; known occupancy/use of site): Bald Eagle, Gulls, Peregrine Falcon

 Mammalian (species; known occupancy/access to site): None

- Disturbance (i.e. livestock, human, etc.): None, waters around the island are very shallow and thus make it difficult for boaters to approach island safely.

Comments: _____

Site Management

- Management History (describe): No management.
- Current Management (describe): No management.
- Management Potential: This island is a relatively newly formed island and thus remains unvegetated. There was no evidence of nesting by gulls, terns, or cormorants. The interior part of the island consists of soft sand while the shoreline areas are firmer and more likely to be used by nesting Caspian terns. It was unclear however, how much of this area remained above the high water line. No habitat enhancement would be necessary, but decoys and recordings would help attract Caspian terns to the island. Since this island is located near a historic nesting island (that is no longer available), the potential for establishing a Caspian tern colony is high. There are no mammalian predator and human disturbance issues. The main concern would be gull predation if a nesting gull population were to also get established.



Potential Caspian tern nesting area (along shoreline) above, and sandy interior areas of the island below.



**CASPIAN TERN SITE FEASIBILITY ASSESSMENT
FIELD FORM**

Date: July 24, 2002 Observer(s): N. Seto, Jack Smith, Max Zahn

Site Name: Cate Island, Grays Harbor, Grays Harbor County, Washington

Ownership: Washington State (Department of Natural Resources) and private ownership

● Location:

- Nearest City/Town: Ocosta, Washington
- Bay/Estuary/Waterbody: Grays Harbor
- Coordinates: Latitude N 46° 54' 57.3" Longitude W 124° 00' 44.4"
- Township, Range, Section: _____
- UTM Coordinates: Northing: 5196308 Easting: 422924.72 Zone: 10

● Size:

Total area of island or site: 8 - 12 ha (20 - 30 a)

Area of current/historical suitable habitat: None

Area of potential habitat: 0.8 - 1.2 ha (2 - 3 a)

● Distance from East Sand Island: ~80 km (50 mi)

● Aerial photo obtained? (Y) or N Date/Source of Aerial Photo: _____

Site Description

● Type of site: Island Peninsula Lakeshore Rooftop Other

● Natural or Manmade? ★ Site Photographs? (Y) or N Number Taken: 9

● Structures present (i.e. roads, buildings, power lines, piers, etc.)? None

● Vegetative communities (i.e. forb, grass, shrub, tree): European beach grass and dune grass, low forbs, some willow and scotch broom shrubs scattered along edge of vegetation.

● Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Sand

● Site stability: Semi-stable, but island has been accreting

● Topography and Site profile: Flat with a rise of < 5 feet, interior part of island is heavily vegetated, shoreline and sandy spit on southeast portion of island is more appropriate for terns

Comments: _____

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): No nesting; ~100 adults and fledged chicks observed roosting on southeast tip of island during site visit.
- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
Various shorebird species		Large roost site	
- Prey Base (describe general type and distance from colony): Shiner perch, Pacific staghorn sculpin, white seaperch, chum salmon, whitebait smelt, snake prickleback, cutthroat trout, longnose dace, and northern anchovy.
 State or Federal listed fish species potential prey? Yes or No
 Species: _____
- State or Federal listed wildlife/plants species associated with site: Bald Eagle, Snowy Plover, Brown Pelicans.
 Management issues: None
- Predators:

Avian (species; known occupancy/use of site): Bald Eagle, Gulls, Peregrine Falcon

Mammalian (species; known occupancy/access to site): Coyote
- Disturbance (i.e. livestock, human, etc.): Part of the island is privately owned and owners frequently camp on the island and have free access to the entire island (young children have been observed on island).

Site Management

- Management History (describe): No management.
- Current Management (describe): No management .
- Management Potential: This site is used as aroosting/loafing area by large number of terns. It is unclear whether the unvegetated portion of the island remains above the high water line throughout the Caspian tern breeding season. Some vegetation on the higher portions of the island adjacent to the area used by roosting terns could be removed to provide potential nesting habitat. Long term maintenance would most likely need to occur to keep the newly created area unvegetated. Human disturbance, however, would be a problem at this site. Portions of the island privately owned and used frequently as a recreation site. In addition, since the site is close to the mainland, the potential for coyote occurrence and predation is high.



Profile of island above, and roosting Caspian terns and potential nesting area (southeastern spit) below.



**CASPIAN TERN SITE FEASIBILITY ASSESSMENT
FIELD FORM**

Date: Aug 6, 2002 Observer(s): N. Seto, Michelle Tirhi

Site Name: Bldg 407, North Coast Yachts, Pierce County, Washington
Ownership: Port of Tacoma

- Location:
 - Nearest City/Town: Tacoma, Washington
 - Bay/Estuary/Waterbody: Commencement Bay, Puget Sound
 - Coordinates: Latitude N 47° 16' 45.1" Longitude W 122° 24' 26.6"
 - Township, Range, Section: T21N R3E S27
 - UTM Coordinates: Northing: 5236358 Easting: 544809.8 Zone: 10
- Size:
 - Total area of island or site: 0.2 ha (0.5 a)
 - Area of current/historical suitable habitat: 0.1 ha (<.25 a)
 - Area of potential habitat: None

- Distance from East Sand Island: ~ 163 km (101 mi)
- Aerial photo obtained? Y or (N) Date/Source of Aerial Photo: _____

Site Description

- Type of site: Island Peninsula Lakeshore Roof Other _____
- Natural or Manmade? ★ Site Photographs? (Y) or N Number Taken: 2
- Structures present (i.e. roads, buildings, power lines, piers, etc.)? Building
- Vegetative communities (i.e. forb, grass, shrub, tree): None
- Soil substrate (i.e. sand, gravel, silt, cobble, etc.): None
- Site stability: "Unstable" -Port of Tacoma will place bird guards on roof after 2002 season
- Topography and Site profile: Flat

Comments: These birds are most likely the same birds that nested on the ASARCO site from 1998 - 2000 and on the temporary barge in 2001. No discrete nests were observed by WDFW biologist (M. Tirhi) when conducting a survey in mid-July. The terns laid their eggs directly on the roof.

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): 347 adults, 96 juveniles, 31 incubating adults and 11 unattended eggs observed on 9 Jul 2002.

- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
Glaucous-winged gull	unknown	not counted	Discrete straw/dirt nests observed on flat and curved section of roof, adjacent to tern nesting area.

- Prey Base (describe general type and distance from colony): Surfperch, salmonids (chum and chinook), herring, and sardines
 State or Federal listed fish species potential prey? ☒ Yes or No
 Species: Puget Sound Chinook Salmon ESU (threatened status)

- State or Federal listed wildlife/plants species associated with site: Bald Eagle,
 Management issues: None

- Predators:

Avian (species; known occupancy/use of site): Bald Eagle, Gulls, Peregrine Falcon occur in area, but no direct observations of predation.

Mammalian (species; known occupancy/access to site): None

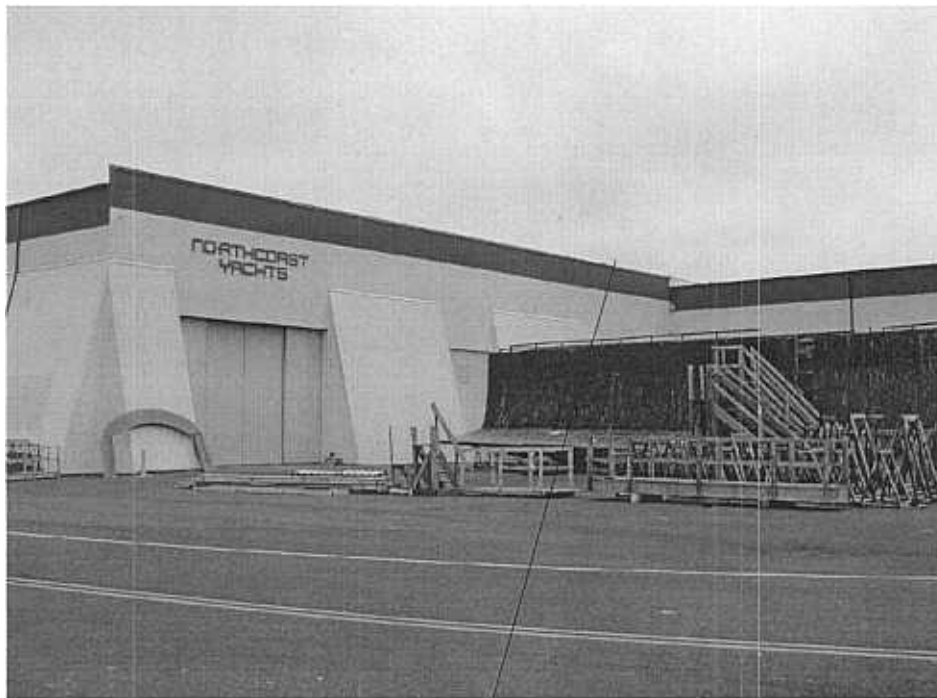
- Disturbance (i.e. livestock, human, etc.): Human activity around building
 Comments: _____

Site Management

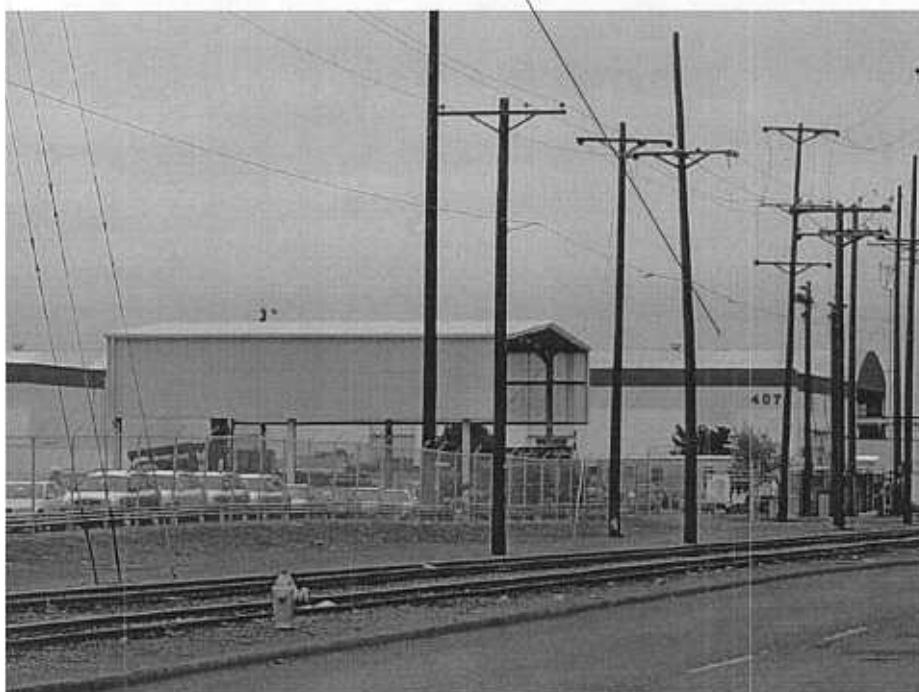
- Management History (describe): N/A

- Current Management (describe): Port of Tacoma plans on cleaning the roof and placing bird guards before the 2003 nesting season to discourage terns from nesting on rooftop again.

- Management Potential: This site is unsuitable because the building owner (Port of Tacoma) and resident (North Coast Yachts) do not like the noise, odor, and bird droppings associated with the terns and gulls nesting on the roof. The Port plans on placing bird guards prior to the next breeding season to ensure that the birds will not nest on the roof again. These birds will most likely find another rooftop in the area or attempt to nest at the ASARCO site again. Alternative sites in southern Puget Sound are limited because of high urbanization. There are no isolated flat islands in the area that would serve as quality nesting habitat with no potential for human disturbance or presence of mammalian predators.



Terns nested on flat portion of roof



**CASPIAN TERN SITE FEASIBILITY ASSESSMENT
FIELD FORM**

Date: December 11, 2002 Observer(s): N. Seto, Richard Kessler, Michelle Tirhi, Marian Bailey

Site Name: Bradley Cove, McNeil Island, Pierce County, Washington

Ownership: Washington Department of Fish and Wildlife

● Location:

- Nearest City/Town: Tacoma, Washington
- Bay/Estuary/Waterbody: Puget Sound
- Coordinates: Latitude N 47° 14' Longitude W 122° 42'
- Township, Range, Section: T20NR1ES9
- UTM Coordinates: Northing: 5231138.0 Easting: 522708.4 Zone: 10

● Size:

Total area of island or site ~1.2 ha (3a)
Area of current/historical suitable habitat: None
Area of potential habitat: !1.2 ha (3a)

● Distance from East Sand Island: ~ 142 km (88 mi)

● Aerial photo obtained? Y or (N) Date/Source of Aerial Photo: _____

Site Description

● Type of site: Island Peninsula Lakeshore Rooftop Other Flat Grassy upland immediately adjacent to shoreline of small cove.

● Natural or Manmade? ★ Site Photographs? Y or (N) Number Taken: _____

● Structures present (i.e. roads, buildings, power lines, piers, etc.)? None

● Vegetative communities (i.e. forb, grass, shrub, tree): Grasses adjacent to shoreline and creek mouth in small cove.

● Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Sand and soil

● Site stability: Stable

● Topography and Site profile: Flat grassy area with adjacent shoreline and creek mouth.

Comments: _____

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): None
- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
None			
- Prey Base (describe general type and distance from colony): Surfperch, salmonids (chum and chinook), herring, and sardines
 State or Federal listed fish species potential prey? ☒ Yes or No
 Species: Puget Sound Chinook Salmon ESU (threatened status)
- State or Federal listed wildlife/plants species associated with site: Bald Eagle
 Management issues: None
- Predators:

Avian (species; known occupancy/use of site):	<u>Possibly Bald Eagle, Peregrine Falcon</u>
Mammalian (species; known occupancy/access to site):	<u>Coyote and raccoons.</u>
- Disturbance (i.e. livestock, human, etc.): Traffic associated with personnel working at State correctional facility occurs at low frequencies on nearby road. Site would need to be fenced or signed to prevent people from walking into colony.

Site Management

- Management History (describe): Protected as part of WDFW wildlife area. No general public access.
- Current Management (describe): Site is currently mowed every year.
- Management Potential: The grassy vegetation layer on the site can be scraped off and removed. Sand and small gravel/pebble material can be deposited to create nesting habitat preferred by caspian terns. A fence would need to be constructed to protect the site and potential nesting terns from mammalian predators such as coyotes and raccoons. Decoys and recordings would be necessary to attract terns to the site.

Comments: Two other sites (Hogan Point and Hyde Point) were also reviewed. Hogan Point was small ($\leq 1a$) and would require removal of large amounts of driftwood, habitat used by the native western fence lizard, and vegetation. Human disturbance was also possible at this site. Hyde Point consisted of a high berm with a low area adjacent to a steep bluff. This site would need to be filled but erosion of fill material would be high.

**CASPIAN TERN SITE FEASIBILITY ASSESSMENT
FIELD FORM**

Date: July 8, 2002 Observer(s): Jeff Dillon, Nanette Seto, Marie Fernandez

Site Name: Snag Islands, Pacific County, Washington

Ownership: Mostly private, but small sections are County and State (DNR) owned.

● Location:

- Nearest City/Town: South Bend, Washington
- Bay/Estuary/Waterbody: Willapa Bay
- Coordinates: Latitude N 46° 40' 05" Longitude W 123° 58' 07"
- Township, Range, Section: T14N R10W Section 30?
- UTM Coordinates: Northing: 5168733 Easting: 425906.03 Zone: 10

● Size:

Total area of island or site: ~12-16 ha (30-40 a), tide dependent

Area of current historical suitable habitat: Unknown

Area of potential habitat: < 1 ha (1-2 a)

● Distance from East Sand Island: ~50 km (31m)

● Aerial photo obtained? Y or (N) Date/Source of Aerial Photo: _____

Site Description

● Type of site: (Island) Peninsula Lakeshore Rooftop Other

(Natural) or Manmade? ★ Site Photographs? (Y) or N Number Taken: 6

● Structures present (i.e. roads, buildings, power lines, piers, etc.)? None

● Vegetative communities (i.e. forb, grass, shrub, tree): Some patches of *Spartina* but mostly bare sand on island.

● Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Sand

● Site stability: Unstable

● Topography and Site profile: Flat

Comments: Historic colony of Caspian tern nested on Gunpowder Sands (now underwater) and Ellen Sands (part of Snag Islands).

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): No nesting; some adult and fledglings observed roosting on island or flying overhead during site visit.

- Colonial Nesting Waterbirds:

Species Years of Occupancy Colony Size Distance from Caspian Terns

None nesting, but heavily used by shorebirds and Brown Pelicans as roost sites.

- Prey Base (describe general type and distance from colony): Anchovy, herring, salmonids, perch

State or Federal listed fish species potential prey? (Yes) or No

Species: Chinook, chum, coho, and steelhead

- State or Federal listed wildlife/plants species associated with site: Bald Eagle

Management issues: None

- Predators:

Avian (species; known occupancy/use of site): Bald Eagle, Corvids, Gull sp.

Mammalian (species; known occupancy/access to site): None

- Disturbance (i.e. livestock, human, etc.): Oyster farms, boaters

Comments: _____

Site Management

- Management History (describe): No management.

- Current Management (describe): No management.

- Management Potential: This site is very unstable and does not provide high quality nesting Caspian tern habitat. Gunpowder Sands, a historic nesting island in the bay, has eroded and is no longer above water. This could potentially also occur at this site unless invasive actions, such as installing a permanent dike or protective barrier, is taken. Such actions would most likely impact the ecology of the bay, and thus, would not be a preferred option. Therefore, nesting habitat is a limiting factor in Willapa Bay.



**CASPIAN TERN SITE FEASIBILITY ASSESSMENT
FIELD FORM**

Date: December 12, 2002 Observer(s): Nanette Seto, R. Milner

Site Name: Jetty Island, Snohomsh County, Washington

Ownership: Port of Everett, managed by Everett City Parks

● Location:

- Nearest City/Town: Everett, WA
- Bay/Estuary/Waterbody: Central Puget Sound
- Coordinates: Latitude N 48° 00' 25" Longitude W 122° 13' 41"
- Township, Range, Section: T29N R5E Section 7
- UTM Coordinates: Northing: 5317360 Easting: 557575.5 Zone: 10

● Size:

Total area of island or site: 4 km long x .8 km wide = 320 ha (790a)

Area of current/historical suitable habitat: None

Area of potential habitat: 1.2-2 ha (3-5 a)

● Distance from East Sand Island: 145 mi/233 km

● Aerial photo obtained? Y or (N) Date/Source of Aerial Photo: _____

Site Description

● Type of site: Island Peninsula Lakeshore Rooftop Other

● Natural or Manmade? ★ Site Photographs? (Y) or N Number Taken: 11

● Structures present (i.e. roads, buildings, power lines, piers, etc.)? Boat ramp and small structure near south end of island.

● Vegetative communities (i.e. forb, grass, shrub, tree): Mostly Scotch broom and some blackberry. Some dune grass at south end.

● Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Sand and silt.

● Site stability: Semi-stable, concern for erosion on west side.

● Topography and Site profile: Flat, only rise to 5' high.

Comments: Did not go to island. Observations made from shore and overlook.

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): None

- Colonial Nesting Waterbirds:

Species Years of Occupancy Colony Size Distance from Caspian Terns

None

- Prey Base (describe general type and distance from colony): Coho and Chinook salmon, some steelhead, Shiner perch, herring, sandlance.

State or Federal listed fish species potential prey? ☒ Yes or No

Species: Chinook salmon.

- State or Federal listed wildlife/plants species associated with site: Bald Eagle

Management issues: _____

- Predators:

Avian (species; known occupancy/use of site): Peregrine falcon, gulls, bald eagle.

Mammalian (species; known occupancy/access to site): No natural access but dogs allowed with visiting public.

- Disturbance (i.e. livestock, human, etc.): Island open to public all year round. In the summer, Everett Parks runs a ferry out to the island regularly and people are free to walk the entire island. However, it doesn't appear that people would walk to the northern end of the island. (R. Milner pers. Comm.)

Site Management

- Management History (describe): Managed by Everett City Parks as recreation site. During summer months a ferry takes public out to the island.

- Current Management (describe): Same as above.

- Management Potential: The vegetation, primarily Scotch broom, can be removed from a section at the northern end of the island. Dependency on the remaining substock, some additional sand or gravel may need to be added to the site. Potential erosion of the site would need to be evaluated. Vegetation removal would most likely need to be repeated in the future.



Southern end of Jetty Island with boat landing, above, viewed from Everett Boat Ramp and northern end of Jetty Island below.



**CASPIAN TERN SITE FEASIBILITY ASSESSMENT
FIELD FORM**

Date: August 13, 2002 Observer(s): N. Seto, Mike Davison

Site Name: Unnamed Island, Padilla Bay, Skagit County, Washington
Ownership: Private (Lee Loncosty)

● Location:

- Nearest City/Town: Anacortes, Washington
- Bay/Estuary/Waterbody: Padilla Bay, Puget Sound
- Coordinates: Latitude N 48° 28' 29.3" Longitude W 122° 31' 58.7"
- Township, Range, Section: T 35N, R2E (no section number available)
- UTM Coordinates: Northing: 5369171.5 Easting: 534531.8 Zone: 10

● Size:

Total area of island or site: 2 ha (5 a)
Area of current/historical suitable habitat: <0.1 ha (<0.25 a)
Area of potential habitat: ~ 0.8 ha (2 a)

- Distance from East Sand Island: ~267 km (~167 mi)
- Aerial photo obtained? (Y) or N Date/Source of Aerial Photo: WDFW 1976

Site Description

- Type of site: Island Peninsula Lakeshore Rooftop Other
- Natural or Manmade? ★ Site Photographs? (Y) or N Number Taken: 10
- Structures present (i.e. roads, buildings, power lines, piers, etc.)? None
- Vegetative communities (i.e. forb, grass, shrub, tree): European beach grass and dune grass, and one large shrub/tree.
- Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Sand
- Site stability: Semi-stable, interior vegetated part of island is stable but sandy shoreline changes shape.
- Topography and Site profile: Flat with a rise of < 4 feet, interior part of island is heavily vegetated, shoreline and sandy spit on northwest portion of island is more appropriate for terns.

Comments: Density of nesting gulls appears higher than in previous years (Mike Davison).

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): Unknown for 2002 because not surveyed. Approx. 110 adults and fledglings were observed roosting on shoreline. Nesting has occurred in the past (peak of ~ 126 nests in 1995).

- Colonial Nesting Waterbirds:

Species	Years of Occupancy	Colony Size	Distance from Caspian Terns
Glaucous-Winged x western gull		< 250	

- Prey Base (describe general type and distance from colony): Salmonids, Bulltrout, smelt, Pacific sand lance, Pacific herring, three-spined stickleback, shiner perch, striped perch
 State or Federal listed fish species potential prey? (Yes) or No
 Species: Puget Sound Chinook

- State or Federal listed wildlife/plants species associated with site: Bald Eagle
 Management issues: None

- Predators:

Avian (species; known occupancy/use of site): Bald Eagle, gulls

Mammalian (species; known occupancy/access to site): Coyote, raccoon

- Disturbance (i.e. livestock, human, etc.): This island is located along the main navigation channel (Swinomish channel) and thus is subjected to any potential disturbance associated with boat activities.

Site Management

- Management History (describe): No management.

- Current Management (describe): No management.

- Management Potential: This island is heavily vegetated and used by nesting gulls. The sandy shoreline located on the northwestern end of the island is where Caspian terns historically nested. This area is still good nesting habitat but has eroded in recent years. Possible habitat enhancement activities to enlarge the nesting area include removing some vegetation inland from this site. Open sandy areas on the northeast side of the island is available, but most likely is not used by nesting terns because of the exposure to boat traffic and wind or wave actions. Decoys and recordings would help attract Caspian terns back to the island. Vegetation removal may need to occur repeatedly in the future as dune grass will most likely spread back into any cleared area. The site is located within .5 mile of the mainland and adjacent to a navigation channel, thus, potential mammalian predators and human disturbance issues are possible. Potential gull predation could also occur. WDFW is currently considering creating flat and open islands in Padilla Bay to serve as wintering roosting areas for the pale-bellied brant. If this occurs, these islands could easily serve as nesting habitat for Caspian terns during the spring and summer months. This process would most likely not occur for several years.



Historic Caspian tern nesting area (northwest portion of island), above and potential nesting area (northeast portion of island), below.



**CASPIAN TERN FEASIBILITY ASSESSMENT
FIELD FORM**

Date: August 2, 2002 Observer(s): J. Dillon, C. Thompson

Site Name: Solstice Island Potholes Reservoir, Grant County, Washington

Ownership: Bureau of Reclamation

● Location:

- Nearest City/Town: Moses Lake, Washington
- Bay/Estuary/Waterbody: Potholes Reservoir
- Coordinates: Latitude N 47° 01' 17" Longitude W 119° 21' 11"
- Township, Range, Section: T18N R27E Sect. 25 NW ¼
- UTM Coordinates: Northing: 5210228.0 Easting: 321182.3 Zone: 11

● Size:

Total area of island or site: 0.4 ha (1 a)

Area of current historical suitable habitat: 0.1 ha (0.25 a)

Area of potential habitat: may be double the size

● Distance from East Sand Island: 360 km (224 mi)

● Aerial photo obtained? Y or (N) Date/Source of Aerial Photo: _____

Site Description

● Type of site (Island) Peninsula Lakeshore Rooftop Other

● (Natural) or Manmade? ★ Site Photographs? (Y) or N Number Taken: 4

● Structures present (i.e. roads, buildings, power lines, piers, etc.): None

● Vegetative communities (i.e. forb, grass, shrub, tree): Shrubby willow

● Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Sand, silt

● Site stability: Stable as long as main willow clumps remain intact.

● Topography and Site profile: The area is a domed mound of sand with fluctuating water levels; birds nesting at waters edge in June, nest site 10' above water by early August.

Comments: The islands and reservoir are owned by Bureau of Reclamation but islands are managed by Washington Dept. of Fish and Wildlife.

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): 150 adults;
Nesting on east end of island, success unknown (chicks fledged earlier than expected)

- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
California Gull			>500 birds (both species
Ring-billed Gull			combined)

- Prey Base (describe general type and distance from colony): Perch, walleye, sunfish,
smallmouth and largemouth bass, Chinook salmon from Columbia River

State or Federal listed fish species potential prey? Yes or No

Species: Salmonids

- State or Federal listed wildlife/plants species associated with site: None

Management issues: _____

- Predators:

Avian (species; known occupancy/use of site): Corvids, gulls

Mammalian (species; known occupancy/access to site): Coyote, raccoon

- Disturbance (i.e. livestock, human, etc.): Boaters, fishermen, campers, day-users

Comments: _____

Site Management

- Management History (describe): None

- Current Management (describe): None

- Management Potential (describe): This site has been used by nesting Caspian terns. Vegetation is filling in the crest of the island which is where the bulk of the nesting occurs. Management potential includes removing some of the vegetation, posting signs to keep people off the island, have law enforcement officers routinely patrol the area, etc. The main issue with the area is fluctuating water levels. It also appears that Caspian terns are flying to the Columbia River to forage. The Bureau of Reclamation and WA Dept. of Fish and Wildlife need to be involved in discussions of these islands.



Nesting site is between blue backpack and willows.



Looking Southeast from the Solstice Island nest site. Sand in foreground is under water in May.

**CASPIAN TERN FEASIBILITY ASSESSMENT
FIELD FORM**

Date: August 2, 2002 Observer(s): J. Dillon, C. Thompson

Site Name: Un-named Island, Potholes Reservoir, Grant County, Washington
Ownership: Bureau of Reclamation

● Location:

- Nearest City/Town: Moses Lake, Washington
- Bay/Estuary/Waterbody: Potholes Reservoir
- Coordinates: Latitude N 47° 00' 60" Longitude W 119° 23' 24"
- Township, Range, Section: T18N R27E Sect. 26 NW ¼
- UTM Coordinates: Northing: 5209788.5 Easting: 318359.06 Zone: 11

● Size:

Total area of island or site: 0.4 ha (1 a)
Area of current historical suitable habitat: 0.2 ha (0.5 a)
Area of potential habitat: 0.2 ha (0.5 a)

- Distance from East Sand Island: 359 km (223 mi)
- Aerial photo obtained? Y or (N) Date/Source of Aerial Photo: _____

Site Description

- Type of site: Island Peninsula Lakeshore Rooftop Other
- Natural or Manmade? ★ Site Photographs? (Y) or N Number Taken: 4

- Structures present (i.e. roads, buildings, power lines, piers, etc.)? None

- Vegetative communities (i.e. forb, grass, shrub, tree): Shrubby willow, grass, forbs

- Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Sand

- Site stability: Stable as long as main willow clumps remain intact

- Topography and Site profile: The area is a domed mound of sand with fluctuating water levels; birds nesting near waters edge in June, nest site 10' above water by early August.

Comments: The islands and reservoir are owned by Bureau of Reclamation but islands are managed by Washington Dept. of Fish and Wildlife.

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): 95 nest in 2002
Nest destroyed by campers' dogs.

- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
California Gull			>200 birds (both species
Ring-billed Gull			combined)

- Prey Base (describe general type and distance from colony): Perch, walleye, sunfish,
smallmouth and largemouth bass, Chinook salmon from Columbia River.

State or Federal listed fish species potential prey? ☒ Yes or No
Species: Salmonids

- State or Federal listed wildlife/plants species associated with site: None

Management issues: _____

- Predators:

Avian (species; known occupancy/use of site): Corvids, gulls

Mammalian (species; known occupancy/access to site): Coyote, raccoon, domestic dogs

- Disturbance (i.e. livestock, human, etc.): Boaters, fishermen, campers, day-users

Comments: PIT tags have been collected at Caspian terns colonies indicating terns are foraging
in Columbia River.

Site Management

- Management History (describe): None

- Current Management (describe): None

- Management Potential (describe): This site has been used by nesting Caspian terns. Vegetation is filling in the crest of the island which is where the bulk of the nesting occurs. Management potential includes removing some of the vegetation, posting signs to keep people off the island, have law enforcement officers routinely patrol the area, etc. The main issue with the area is fluctuating water levels. It also appears that Caspian terns are flying to the Columbia River to forage. The Bureau of Reclamation and WA Dept. of Fish and Wildlife need to be involved in discussions of these islands.

Looking north across nesting site. Nesting within the short vegetation.



**CASPIAN TERN FEASIBILITY ASSESSMENT
FIELD FORM**

Date: August 1, 2002 Observer(s): J. Dillon

Site Name: Harper Island, Sprague Lake, Lincoln and Adams Counties, Washington

Ownership: State of Washington

● Location:

- Nearest City/Town: Sprague, Washington
- Bay/Estuary/Waterbody: Sprague Lake
- Coordinates: Latitude N 47° 15' 15" Longitude W 118° 05' 07"
- Township, Range, Section: T20N R38E Sect. 7 NW ¼
- UTM Coordinates: Northing: 5233980.5 Easting: 417883.34 Zone: 11

● Size:

Total area of island or site: 2.8 - 3.2 ha (7 - 8 a)
Area of current/historical suitable habitat: unknown
Area of potential habitat: small scattered patches

- Distance from East Sand Island: 462 km (287 mi)
- Aerial photo obtained? Y or (N) Date/Source of Aerial Photo: _____

Site Description

- Type of site: Island Peninsula Lakeshore Rooftop Other
- Natural or Manmade? ★ Site Photographs (Y) or N Number Taken: 16
- Structures present (i.e. roads, buildings, power lines, piers, etc.)? None
- Vegetative communities (i.e. forb, grass, shrub, tree): One tree, shrub, forbs, grass, shrubby willow along some edges
- Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Rock, sand, silt
- Site stability: Stable
- Topography and Site profile: A 1-20 foot rise above water level, steep sided

Comments: State wildlife area is located on the southwest side of the lake; county sprays insecticide every year for the last 2-3 years across area to kill mayfly type insect - traffic issue on I-90; a single adult Caspian tern observed flying west over lake; Bonaparte's gull, western grebe also present.

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): Suspected but unknown

- Colonial Nesting Waterbirds:

Species	Years of Occupancy	Colony Size	Distance from Caspian Terns
Gull spp.		Unknown	→ from resort owner >5,000 pr
Double-crested Cormorant		Unknown	

- Prey Base (describe general type and distance from colony): Perch, walleye, rainbow trout, sunfish, small-mouthed and large-mouthed bass, crappie, catfish (channel?), bullheads.

State or Federal listed fish species potential prey? Yes or ☒ No

Species: _____

- State or Federal listed wildlife/plants species associated with site: None

Management issues: _____

- Predators:

Avian (species; known occupancy/use of site): Corvids, gulls, red-tailed hawk

Mammalian (species; known occupancy/access to site): None

- Disturbance (i.e. livestock, human, etc. Boaters, fishermen

Comments: ~200 white pelicans can be seen during the summer, roost on west end of island along water edge, currently < 50 observed, on day of site visit.

Site Management

- Management History (describe): None

- Current Management (describe): None

- Management Potential (describe): Caspian terns occasionally nest here. Some of the vegetation could be removed from the island to establish a Caspian tern nesting area. However, the prey base is probably a limiting factor. The lake is stocked with sport fish. Many of these species are predatory species and therefore this probably influences the availability of small fish as a prey base for Caspian terns.

Comments: Lake is natural, however, water level is artificially raised for irrigation to west Island is 2-300 yards from resort on north shore.



South shore



North shore

**CASPIAN TERN FEASIBILITY ASSESSMENT
FIELD FORM**

Date: July 31, 2002 Observer(s): J. Dillon, C. Thompson

Site Name: Un-named Island #1, Banks Reservoir, Grant County, Washington

Ownership: Bureau of Reclamation

● Location:

- Nearest City/Town: Coulee City, Washington
- Bay/Estuary/Waterbody: Banks Reservoir
- Coordinates: Latitude N 47° 38' 05" Longitude W 119° 19' 02"
- Township, Range, Section: T25N R28E Sect. 28 NW ¼
- UTM Coordinates: Northing: 5278304.0 Easting: 325933.25 Zone: 11

● Size:

Total area of island or site: 0.8 ha (2 a)
Area of current/historical suitable habitat: _____
Area of potential habitat: 0.2 ha (0.5 a)

● Distance from East Sand Island: 385 km (239 mi)

● Aerial photo obtained? Y or (N) Date/Source of Aerial Photo: _____

Site Description

● Type of site: Island Peninsula Lakeshore Rooftop Other

● Natural or Manmade? ★ Site Photographs? (Y) or N Number Taken: 2

● Structures present (i.e. roads, buildings, power lines, piers, etc.)? None

● Vegetative communities (i.e. forb, grass, shrub, tree): Shrub, sage brush, forbs, grass

● Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Rock, gravel, sand

● Site stability: Stable

● Topography and Site profile: A 1-8 foot rise above water level

Comments: _____

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): None

- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
None			

- Prey Base (describe general type and distance from colony): Perch, walleye, trout, kokanee, sunfish, small-mouthed and large-mouthed bass, pike minnow, carp

State or Federal listed fish species potential prey? Yes or ☒ No
Species: _____

- State or Federal listed wildlife/plants species associated with site: None

Management issues: _____

- Predators:

Avian (species; known occupancy/use of site): Corvids, gulls, golden eagles, prairie falcon

Mammalian (species; known occupancy/access to site): Potentially coyote, raccoon, mink

- Disturbance (i.e. livestock, human, etc.): Boaters, fishermen

Comments: _____

Site Management

- Management History (describe): None

- Current Management (describe): None

- Management Potential (describe): Caspian terns probably have never nested here. There is some potential nesting habitat at the north end of the island. However, Banks Lake is used for irrigation and therefore water levels fluctuate greatly over the year. The island has very limited nesting habitat available due to the very rocky substrate. There is no real way to expand the available nesting habitat and the area is most likely under water by May.

Looking south across island. Banks Reservoir dam is in the background.



**CASPIAN TERN FEASIBILITY ASSESSMENT
FIELD FORM**

Date: August 1, 2002 Observer(s): J. Dillon, C. Thompson

Site Name: Un-named Island #2, Banks Reservoir, Grant County, Washington
Ownership: Bureau of Reclamation

● Location:

- Nearest City/Town: Coulee City, Washington
- Bay/Estuary/Waterbody: Banks Reservoir
- Coordinates: Latitude N 47° 37' 30" Longitude W 119° 18' 10"
- Township, Range, Section: T25N R28E Sect. 33 NE ¼
- UTM Coordinates: Northing: 5277191.0 Easting: 326986.0 Zone: 11

● Size:

Total area of island or site: 2.8 - 4.0 ha (7 - 10 a)
Area of current/historical suitable habitat: unknown
Area of potential habitat: 1.2 ha (3 a)

- Distance from East Sand Island: 385 km (239 mi)
- Aerial photo obtained? Y or (N) Date/Source of Aerial Photo: _____

Site Description

- Type of site: Island Peninsula Lakeshore Rooftop Other
- (Natural) or Manmade? ★ Site Photographs? (Y) or N Number Taken: 5
- Structures present (i.e. roads, buildings, power lines, piers, etc.)? 8-12 55-gallon drums filled with rocks and cabled to ground with 10 foot lengths of 10 gauge wire
- Vegetative communities (i.e. forb, grass, shrub, tree) : Trees, shrub, forbs, grass

- Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Rock, gravel, sand, silt

- Site stability: Stable
- Topography and Site profile: A 1-15 foot rise above water level

Comments: _____

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): Suspected but unknown.

- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
California gull		Unknown →	appears most common species
Ring-billed gull		Unknown	by dead birds present
Perhaps 6,000-10,000 pairs based on area used for nesting			
Black-crowned Night-heron		30+ juveniles observed in various stages of flight	

- Prey Base (describe general type and distance from colony): Perch, walleye, trout, kokanee, sunfish, small-mouthed and large-mouthed bass, pike minnow, carp

State or Federal listed fish species potential prey? Yes or No

Species: _____

- State or Federal listed wildlife/plants species associated with site: None

Management issues: _____

- Predators:

Avian (species; known occupancy/use of site): Corvids, gulls, golden eagles, prairie falcon

Mammalian (species; known occupancy/access to site): Potentially coyote, raccoon, mink

- Disturbance (i.e. livestock, human, etc.): Boaters, campers, fishermen

Comments: One potential nest scrape but inconclusive.

Site Management

- Management History (describe): None

- Current Management (describe): None

- Management Potential (describe): Caspian terns may occasionally nest here. However, Banks Lake is used for irrigation and therefore water levels fluctuate greatly over the year. The island has very hard substrate due to the very rocky conditions. Creating a scrape would be very difficult for Caspian terns. There is also a very large gull colony using this site. There is no real way to expand the available nesting habitat.



North View



South View

**CASPIAN TERN FEASIBILITY ASSESSMENT
FIELD FORM**

Date: July 31, 2002 Observer(s): J. Dillon, C. Thompson

Site Name: Goose Island, Banks Reservoir, Grant County, Washington

Ownership: Bureau of Reclamation

● Location:

- Nearest City/Town: Coulee City, Washington
- Bay/Estuary/Waterbody: Banks Reservoir
- Coordinates: Latitude N 47° 38' 48" Longitude W 119° 17' 30"
- Township, Range, Section: T25N R28E Sect. 22 NW ¼
- UTM Coordinates: Northing: 5279574.0 Easting: 327892.34 Zone: 11

● Size:

Total area of island or site: 1.2 ha (3 a) to 0.4 ha (1 a)
Area of current/historical suitable habitat: unknown
Area of potential habitat: < 0.8 ha (2 a)

- Distance from East Sand Island: 388 km (241 mi)
- Aerial photo obtained? Y or (N) Date/Source of Aerial Photo: _____

Site Description

- Type of site: Island Peninsula Lakeshore Rooftop Other
- Natural or Manmade? ★ Site Photographs (Y) or N Number Taken: 5
- Structures present (i.e. roads, buildings, power lines, piers, etc.)? None

- Vegetative communities (i.e. forb, grass, shrub, tree): Shrub, forbs, grass, cattails

- Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Rock, gravel, sand, silt

- Site stability: Stable

- Topography and Site profile: A 1-6 foot rise above water level

Comments: Size of island fluctuates w/ water levels, reservoir is used for irrigation.

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): Have nested here in the past, unknown in 2002, Caspian terns observed in the area during site visit.

- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
Ring-billed gull		Unknown → appears most common species	
California gull		Unknown	by dead birds found

Perhaps 600-1,000 pairs based on area used for nesting, no tern scrapes found

- Prey Base (describe general type and distance from colony): Perch, walleye, trout, kokanee, sunfish, small-mouthed and large-mouthed bass, pike minnow, carp

State or Federal listed fish species potential prey? Yes or No

Species: _____

- State or Federal listed wildlife/plants species associated with site: None

Management issues _____

- Predators:

Avian (species; known occupancy/use of site): Corvids, gulls, golden eagles, prairie falcon

Mammalian (species; known occupancy/access to site): Potentially coyote, raccoon, mink

- Disturbance (i.e. livestock, human, etc.): Boaters, fishermen

Comments: A single adult Caspian tern found dead with nylon fishing line wrapped around bill and legs.

Site Management

- Management History (describe): None

- Current Management (describe): None

- Management Potential (describe): Caspian terns occasionally nest here. However, Banks Lake is used for irrigation and therefore water levels fluctuate greatly over the year. The island has very limited nesting habitat available due to the very rocky substrate. There is no real way to expand the available nesting habitat.



South end of island looking west.



North end of island looking south.

**CASPIAN TERN FEASIBILITY ASSESSMENT
FIELD FORM**

Date: July 3, 2002 Observer(s): J. Dillon, N. Seto, H. Browers

Site Name: Crescent Island, Walla Walla County, Washington
Ownership: Department of Defense, U.S. Army Corp of Engineers

● Location:

Nearest City/Town: Walla Walla, Washington
Bay/Estuary/Waterbody: Columbia River
Coordinates: Latitude N 46° 05' 36" Longitude W 118° 55' 48"
Township, Range, Section: T7N R31E Section 15 NW ¼
UTM Coordinates: Northing: 5106228.5 Easting: 350808.12 Zone: 11

● Size:

Total area of island or site: 3.2 ha (< 8 a)
Area of current/historical suitable habitat: 0.04 ha (4,800 sq. ft.)
Area of potential habitat: Several acres

● Distance from East Sand Island: 386 km (240 mi)
● Aerial photo obtained? (Y) or N Date/Source of Aerial Photo: 09/11/99; Umatilla NWR

Site Description

● Type of site: Island Peninsula Lakeshore Rooftop Other
● Natural or Manmade ★ Site Photographs: (Y) or N Number Taken 7
● Structures present (i.e. roads, buildings, power lines, piers, etc.): Duck blinds

● Vegetative communities (i.e. forb, grass, shrub, tree): Russian olive, cottonwood, willow,
herbaceous, grasses

● Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Sand/gravel/silt, dredged material

● Site stability: Stable

● Topography and Site profile: Rises 4-5 feet above water level

Comments: Melissa Thompson and Rob Westra (OSU research assistants) were also present
during survey; Nest area is a relatively flat expanse of compacted silt.

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): East side of island (see photo), 360 adults (peak), various aged chicks still present.

- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
California gull	unknown	5,000+	Adjacent
Ring-billed gull	unknown	1,000+	Adjacent
Caspian tern	unknown	360	
Blk-crwn Night-heron	unknown	80+	45-50 meters

- Prey Base (describe general type and distance from colony): Salmonids, perch, bass, centrarchids

State or Federal listed fish species potential prey? Yes or No
 Species: Steelhead, sockeye, chinook

- State or Federal listed wildlife/plants species associated with site: None on island

Management issues: _____

- Predators:

Avian (species; known occupancy/use of site): California gull and Ring-billed gull
 Mammalian (species; known occupancy/access to site): None

- Disturbance (i.e. livestock, human, etc.): Boaters

Comments: _____

Site Management

- Management History (describe): No direct tern management.

- Current Management (describe): No direct tern management.

- Management Potential (describe): This island is currently used by Caspian terns. Heavy vegetation covers a large proportion of the island. Vegetation could be cleared back to enlarge the nesting area to over an acre in size. However, there are several issues with the site: 1) A very large gull colony exist on the island with the Caspian terns; 2) The colony is just downstream from the mouth of the Snake River and has several runs of salmonids. A large proportion of the Caspian tern diet is salmonids. Ownership of the island belongs to the Corp of Engineers. Washington Department of Fish and Wildlife and the McNary National Wildlife Refuge personnel would need to be involved since they manage the wildlife resources in the area. A black-crowned night-heron rookery exist near the center of the island. USFWS has an agreement with Corp to manage the islands for the wildlife resources.



Caspian tern colony (left side of picture)



Gull colony (right side of red line)
(Red line approximates division between tern [left] and gull [right] colonies)

**CASPIAN TERN FEASIBILITY ASSESSMENT
FIELD FORM**

Date: July 1, 2002 Observer(s): J. Dillon, N. Seto, H. Browers, B. Allen

Site Name: Straight Six Island, Morrow County, Oregon

Ownership: Department of Interior, U.S. Fish and Wildlife Service

● Location:

- Nearest City/Town: Boardman, Oregon
- Bay/Estuary/Waterbody: Columbia River
- Coordinates: Latitude N 45° 53' 46" Longitude W 119° 39' 39"
- Township, Range, Section: T5N R25E Section 23 SW ¼
- UTM Coordinates: Northing: 5085948.0 Easting: 293582.34 Zone: 11

● Size:

Total area of island or site: 1.2 ha (3.0 a)
Area of current/historical suitable habitat: None
Area of potential habitat: 1.2 ha (3.0 a)

● Distance from East Sand Island: 335 km (208 mi)

● Aerial photo obtained? (Y) or N Date/Source of Aerial Photo: 05/24/02; Umatilla NWR

Site Description

● Type of site: Island Peninsula Lakeshore Rooftop Other

● Natural or Manmade? ★ Site Photographs? (Y) or N Number Taken: 5

● Structures present (i.e. roads, buildings, power lines, piers, etc.)? None

● Vegetative communities (i.e. forb, grass, shrub, tree): False indigo, few alder

● Soil substrate (i.e. sand, gravel, silt, cobble, etc.) Cobble/silt

● Site stability: Stable

● Topography and Site profile: Rises 4 feet above water level.

Comments: _____

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): None

- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
Forester's Tern	Unknown	4 nest/14 adults	

- Prey Base (describe general type and distance from colony): Salmonids, walleye, small-mouthed bass

- State or Federal listed fish species potential prey? Yes or No
 Species: Steelhead, sockeye, chinook

- State or Federal listed wildlife/plants species associated with site: None on island

- Management issues: _____

- Predators:

Avian (species; known occupancy/use of site): California gull, Ring-billed gull, Corvids

Mammalian (species; known occupancy/access to site): None

- Disturbance (i.e. livestock, human, etc.): Boaters, fishermen

Comments: _____

Site Management

- Management History (describe): None

- Current Management (describe): None

- Management Potential (describe): This site has not been used by nesting Caspian terns. The island is currently covered in exotic vegetation. Future management could include the removal of the false indigo shrub. Long-term maintenance will need to be done to ensure Caspian tern nesting habitat. Further enhancements may be warranted before the habitat will be used by Caspian terns(i.e., substrate enhancement). Decoys and tapes may more quickly entice Caspian terns to begin nesting here. If this management technique is employed, the Umatilla NWR personnel will need to be involved.



North side, middle section of Straight Six Island



West end of island gravel bar.

**CASPIAN TERN FEASIBILITY ASSESSMENT
FIELD FORM**

Date: July 1, 2002 Observer(s): J. Dillon, N. Seto, H. Browsers, B. Allen

Site Name: No Name Island #1, Morrow County, Oregon

Ownership: Department of Interior, U.S. Fish and Wildlife Service

● Location:

- Nearest City/Town: Irrigon, Oregon
- Bay/Estuary/Waterbody: Columbia River
- Coordinates: Latitude N 45° 54' 33" Longitude W 119° 37' 22"
- Township, Range, Section: T5N R26E Section 18 SW ¼
- UTM Coordinates: Northing: 5087300.5 Easting: 296582.2 Zone: 11

● Size:

Total area of island or site: 0.6 ha (1.5 a)

Area of current/historical suitable habitat: None

Area of potential habitat: 0.6 ha (1.5 a)

● Distance from East Sand Island: 338 km (210mi)

● Aerial photo obtained? (Y) or N Date/Source of Aerial Photo: 05/24/02; Umatilla NWR

Site Description

● Type of site: Island Peninsula Lakeshore Rooftop Other

● Natural or Manmade? ★ Site Photographs? (Y) or N Number Taken: 7

● Structures present (i.e. roads, buildings, power lines, piers, etc.)? None

● Vegetative communities (i.e. forb, grass, shrub, tree): False Indigo, Russian olive, Yarrow, Grasses

● Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Cobble/silt

● Site stability: Stable

● Topography and Site profile: Rises 3 feet above water level.

Comments: _____

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): None

- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
Forester's Tern	Unknown	10 nest/40 ad	
Ring-billed gull	Unknown	40 adults/ no nest observed	

- Prey Base (describe general type and distance from colony): Salmonids, walleye, small-mouthed bass

State or Federal listed fish species potential prey? Yes or No
 Species: Steelhead, sockeye, chinook

- State or Federal listed wildlife/plants species associated with site: None on island

Management issues: _____

- Predators:

Avian (species; known occupancy/use of site): California gull, Ring-billed gull, Corvids

Mammalian (species; known occupancy/access to site): None

- Disturbance (i.e. livestock, human, etc.): Boaters, fishermen

Comments: _____

Site Management

- Management History (describe): No direct tern management.
- Current Management (describe): Removal of false indigo; island should be Caspian tern ready in the near future; main reason for management is removal of exotic (false indigo)
- Management Potential (describe): This site has not been used by nesting Caspian terns. The island is currently being cleared of exotic vegetation and should be available to Caspian terns in the near future. No further enhancements to the habitat will be needed except for long-term vegetation removal. Decoys and tapes may more quickly entice Caspian terns to begin nesting here. If this technique is employed, the Umatilla NWR personnel will need to be involved.



Forster's terns in flight over small colony site.



Forster's terns nesting in tall vegetation.

**CASPIAN TERN FEASIBILITY ASSESSMENT
FIELD FORM**

Date: July 1, 2002 Observer(s): J. Dillon, N. Seto, H. Browsers, B. Allen

Site Name: No Name Island #2, Morrow County, Oregon

Ownership: Department of Interior, U.S. Fish and Wildlife Service

● Location:

- Nearest City/Town: Boardman, Oregon
- Bay/Estuary/Waterbody: Columbia River
- Coordinates: Latitude N 45° 53' 05" Longitude W 119° 38' 03"
- Township, Range, Section: T5N R25E Section 25 SW ¼
- UTM Coordinates: Northing: 5084614.0 Easting: 295609.66 Zone: 11

● Size:

Total area of island or site: 0.13 ha (1/3 a)
Area of current/historical suitable habitat: None
Area of potential habitat: 0.13 ha (1/3 a)

● Distance from East Sand Island: 336 km (209 mi)

● Aerial photo obtained? (Y) or N Date/Source of Aerial Photo: 05/24/02; Umatilla NWR

Site Description

● Type of site: Island Peninsula Lakeshore Rooftop Other

● Natural or Manmade? ★ Site Photographs? (Y) or N Number Taken: 1

● Structures present (i.e. roads, buildings, power lines, piers, etc.)? None

● Vegetative communities (i.e. forb, grass, shrub, tree): False Indigo

● Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Cobble/silt

● Site stability: Stable

● Topography and Site profile: Rises 4 feet above water level.

Comments: _____

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): None

- Colonial Nesting Waterbirds:

Species Years of Occupancy Colony Size Distance from Caspian Terns

- Prey Base (describe general type and distance from colony): Salmonids, walleye, small-mouthed bass

State or Federal listed fish species potential prey? (Yes) or No

Species: Steelhead, sockeye, chinook

- State or Federal listed wildlife/plants species associated with site: None on island.

Management issues: _____

- Predators:

Avian (species; known occupancy/use of site): California gull, Ring-billed gull, Corvids

Mammalian (species; known occupancy/access to site): None

- Disturbance (i.e. livestock, human, etc. Boaters, fishermen

Comments: _____

Site Management

- Management History (describe): No direct tern management.

- Current Management (describe): No direct tern management.

- Management Potential (describe): This site has not been used by nesting Caspian terns. The island is currently covered in exotic vegetation. Future management could include the removal of the false indigo shrub. Further enhancements may be warranted before the habitat will be used by Caspian terns (i.e., substrate enhancement). Decoys and tapes may more quickly entice Caspian terns to begin nesting here. If this management technique is employed, the Umatilla NWR personnel will need to be involved.



North side of the island.

**CASPIAN TERN FEASIBILITY ASSESSMENT
FIELD FORM**

July 1, 2002 Observer(s): J. Dillon, N. Seto, H. Browsers, B. Allen

Site Name: No Name Island #3, Morrow County, Oregon

Ownership: Department of Interior, U.S. Fish and Wildlife Service, Umatilla NWR

● Location:

- Nearest City/Town: Boardman, Oregon
- Bay/Estuary/Waterbody: Columbia River
- Coordinates: Latitude N 45° 53' 41" Longitude W 119° 38' 50"
- Township, Range, Section: T5N R25E Section 13 SE ¼
- UTM Coordinates: Northing: 5085758.5 Easting: 294633.06 Zone: 11

● Size:

Total area of island or site: 0.6 ha (1.5 a)
Area of current/historical suitable habitat: 0.2 ha (½ a)
Area of potential habitat: 0.4 ha (1.0 a)

● Distance from East Sand Island: 336 km (209 mi)

● Aerial photo obtained? (Y) or N Date/Source of Aerial Photo: 05/24/02; Umatilla NWR

Site Description

● Type of site: Island Peninsula Lakeshore Rooftop Other

● Natural or Manmade? ★ Site Photographs? (Y) or N Number Taken: 6

● Structures present (i.e. roads, buildings, power lines, piers, etc.)? None

● Vegetative communities (i.e. forb, grass, shrub, tree): Herbaceous vegetation, sprouting false indigo

● Soil substrate (i.e. sand, gravel, silt, cobble, etc.) Cobble/silt

stability: Stable

● Topography and Site profile: Rises 2-3 feet above water level.

Comments: Island is surrounded on three sides by Sand Dune Islands.

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): None

- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
Forester's Tern	Unknown	25+ nest/80+ adults	
White Pelican	Roosting	8 adults	

- Prey Base (describe general type and distance from colony): Salmonids, walleye, small-mouthed bass

State or Federal listed fish species potential prey? ☒ Yes or No
Species: Steelhead, sockeye, chinook

- State or Federal listed wildlife/plants species associated with site: None on island
- Management issues: _____

- Predators:
Avian (species; known occupancy/use of site): California gull, Ring-billed gull, Corvids
Mammalian (species; known occupancy/access to site): None

- Disturbance (i.e. livestock, human, etc.): Boaters, fishermen

Comments: _____

Site Management

- Management History (describe): None
- Current Management (describe): None
- Management Potential (describe): This site has not been used by nesting Caspian terns. The island is lightly vegetated and would need to be cleared. The island may be periodically inundated annually which would require yearly cleaning of vegetation. Decoys and tapes may more quickly entice Caspian terns to begin nesting here but several other islands in the area would be better suited. If this technique is employed, the Umatilla NWR personnel will need to be involved.



South view of island.



Distant south view of island (low island in forefront).

**CASPIAN TERN FEASIBILITY ASSESSMENT
FIELD FORM**

Date: July 1, 2002 Observer(s): J. Dillon, N. Seto, H. Browers, B. Allen

Site Name: "Test" Island, Morrow County, Oregon
Ownership: Department of Interior, U.S. Fish and Wildlife Service, Umatilla NWR

- Location:
 - Nearest City/Town: Irrigon, Oregon
 - Bay/Estuary/Waterbody: Columbia River
 - Coordinates: Latitude N 45° 54' 36" Longitude W 119° 37' 47"
 - Township, Range, Section: T5N R25E Section 13 SE ¼
 - UTM Coordinates: Northing: 5087411.0 Easting: 296046.78 Zone: 11

- Size:
 - Total area of island or site: 0.4 ha (1.0 a)
 - Area of current/historical suitable habitat: None
 - Area of potential habitat: 0.4 ha (1.0 a)

- Distance from East Sand Island: 338 km (210 mi)
- Aerial photo obtained? (Y) or N Date/Source of Aerial Photo: 05/24/02; Umatilla NWR

Site Description

- Type of site: Island Peninsula Lakeshore Rooftop Other
- Natural or Manmade? ★ Site Photographs? (Y) or N Number Taken: 4 south; 3 north
- Structures present (i.e. roads, buildings, power lines, piers, etc.)? None

- Vegetative communities (i.e. forb, grass, shrub, tree): Sprouting false indigo, 7 alder trees

- Soil substrate (i.e. sand, gravel, silt, cobble, etc.) Cobble/silt

- Site stability: Stable

- Topography and Site profile: Rises 4 feet above water level.

Comments: _____

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): None

- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
Forester's Tern	Unknown	4 nest/20 ad	
California gull	Unknown	8 adults/ no nest observed	

- Prey Base (describe general type and distance from colony): Salmonids, walleye, small-mouthed bass

State or Federal listed fish species potential prey? ☒ Yes or No
Species: Steelhead, sockeye, chinook

- State or Federal listed wildlife/plants species associated with site: None on island

Management issues: _____

- Predators:

Avian (species; known occupancy/use of site): California gull, Ring-billed gull, Corvids

Mammalian (species; known occupancy/access to site): None

- Disturbance (i.e. livestock, human, etc.): Boaters, fishermen

Comments: _____

Site Management

- Management History (describe): No direct tern management.
- Current Management (describe): Removal of false indigo; island should be Caspian tern ready in the near future; main reason for management is removal of exotic (false indigo).
- Management Potential (describe): This site has not been used by nesting Caspian terns. The island is currently being cleared of exotic vegetation and should be available to Caspian terns in the near future. No further enhancements to the habitat will be needed except for long-term repeated vegetation removal. Decoys and tapes may more quickly entice Caspian terns to begin nesting here. If this technique is employed, the Umatilla NWR personnel will need to be involved.



South side of "Test" Island



West end of "Test" Island

**CASPIAN TERN FEASIBILITY ASSESSMENT
FIELD FORM**

Date: July 2, 2002 Observer(s): J. Dillon, N. Seto, K. Cole, J. Torhlan

Site Name: Miller Rocks, Klickitat County, Washington (Small rocky islands just upstream from Miller Is.)

Ownership: State of Washington

● Location:

- Nearest City/Town: Biggs, Oregon
- Bay/Estuary/Waterbody: Columbia River
- Coordinates: Latitude N 45° 39' 43" Longitude W 120° 52' 35"
- Township, Range, Section: T2N R15E Section 13 NW ¼
- UTM Coordinates: Northing: 5058681.5 Easting: 665433.9 Zone: 10

● Size:

Total area of island or site: 2.0 ha (4-5 a)
Area of current/historical suitable habitat: small scattered sandy patches
Area of potential habitat: same small scattered sandy patches

- Distance from East Sand Island: 248 km (154 mi)
- Aerial photo obtained? Y or (N) Date/Source of Aerial Photo: _____

Site Description

- Type of site: Island Peninsula Lakeshore Rooftop Other
- Natural or Manmade? ★ Site Photographs? (Y) or N Number Taken: 5
- Structures present (i.e. roads, buildings, power lines, piers, etc.)? Several concrete footings on west island
- Vegetative communities (i.e. forb, grass, shrub, tree): False indigo, couple of trees, grass
- Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Rocky, small sandy locations on western rock island.
- Site stability: Stable
- Topography and Site profile: Three tall pillar rocks; island high point ~ 15 feet; remainder of rocks have a 6 foot rise.

Comments: Miller Island is the main large island across from the mouth of the Deschutes River. Just upstream of Miller Island is a small series of basaltic islands. These small islands will be referred to as Miller Rocks in the report.

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): None

- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
California gull	At least 22 years	~4,250 pairs	
Ring-billed gull	At least 22 years	~750 pairs	

- Prey Base (describe general type and distance from colony): Salmonids, carp, small-mouthed bass

State or Federal listed fish species potential prey? (Yes) or No
Species: Salmonid, chinook, and steelhead.

- State or Federal listed wildlife/plants species associated with site: None on island

Management issues: _____

- Predators:

Avian (species; known occupancy/use of site): California gull, Ring-billed gull, Corvids

Mammalian (species; known occupancy/access to site): None

- Disturbance (i.e. livestock, human, etc.): Boaters, fishermen

Comments: _____

Site Management

- Management History (describe): None

- Current Management (describe): None

- Management Potential (describe): This site is currently not used by Caspian terns as a nesting site. There have been recent historical use for nesting. There are only a few small patches of habitat available (6'x6') for nesting and these are surrounded by nesting gulls. The habitat is a very rocky substrate and there is very little that can be done to enlarge the area. Habitat is the limiting factor.



Arrow indicates area potentially used by Caspian terns.



Part of gull colony on basaltic island.

**CASPIAN TERN FEASIBILITY ASSESSMENT
FIELD FORM**

Date: July 2, 2002 Observer(s): J. Dillon, N. Seto, R. Morgan, S. Cherry

Site Name: Threemile Canyon Island, Gilliam County, Oregon

Ownership: Department of Defense, Corp of Engineers ??

● Location:

- Nearest City/Town: Arlington, Oregon
- Bay/Estuary/Waterbody: Columbia River
- Coordinates: Latitude N 45° 49' 03" Longitude W 119° 57' 48"
- Township, Range, Section: T4N R23E Section 20 NW ¼
- UTM Coordinates: Northing: 5078042.0 Easting: 269791.84 Zone: 11

● Size:

Total area of island or site: 2+ ha (5-6 a)
Area of current/historical suitable habitat: 0.1 ha (¼ a)
Area of potential habitat: 0.4 ha (1.0 a)

● Distance from East Sand Island: 314 km (195 mi)

● Aerial photo obtained? Y or (N) Date/Source of Aerial Photo: _____

Site Description

● Type of site: Island Peninsula Lakeshore Rooftop Other

● Natural or Manmade? ★ Site Photographs? (Y) or N Number Taken: 8

● Structures present (i.e. roads, buildings, power lines, piers, etc.)? Wooden blind from Caspian tern study (blind was removed July 3, 2002 for season).

● Vegetative communities (i.e. forb, grass, shrub, tree): False indigo, sagebrush, mulberry, grass, forbs

● Soil substrate (i.e. sand, gravel, silt, cobble, etc.): Sand, gravel, cobble

● Site stability: Stable

● Topography and Site profile: There is a 4-5 foot rise above the water line.

Comments: Part of island is natural but a dike-like barrier has been placed across the island extending beyond each end of the island to protect the boat launch/bay area (see web photo).

Fish and Wildlife Resources

- Specific location, size, reproductive success of Caspian tern colony (if known): None

- Colonial Nesting Waterbirds:

<u>Species</u>	<u>Years of Occupancy</u>	<u>Colony Size</u>	<u>Distance from Caspian Terns</u>
California gull		~4-5,000 pairs	
Ring-billed gull		~50 pairs	
Black-crowned night-heron		Several pair	

- Prey Base (describe general type and distance from colony): Salmonids, walleye, small-mouthed bass, carp

- State or Federal listed fish species potential prey? (Yes) or No
 Species: Salmonid, sockeye, chinook, and steelhead

- State or Federal listed wildlife/plants species associated with site: None on island

- Management issues: _____

- Predators:
 - Avian (species; known occupancy/use of site): California gull, Ring-billed gull, Corvids (crow, black-billed magpie)
 - Mammalian (species; known occupancy/access to site): Coyote, mink

- Disturbance (i.e. livestock, human, etc.): Boaters, fishermen

Comments: False indigo is taking over the beach area.

Site Management

- Management History (describe): None

- Current Management (describe): None

- Management Potential: (describe) This site has been used by nesting Caspian terns until recently. The vegetation is crowding out the Caspian tern nesting area. The current area could be doubled or even tripled in size by removal of vegetation. However, mink forced the abandonment of the colony in 2000 and 2001. Removal of mink would be necessary to ensure chance of success. Nesting area is well above the high water mark.



Caspian tern nest site along north shore.



Caspian tern nest site with monitoring blind in background.